

INDEX.

Illustrated articles indicated by *.

A.

Aaron, C. F., Address by, 1039
 Abrasive materials, Production of, 1971
 Acme Lathe & Products Co., 198
 Adams, C. E., *934
 Adams, Ezra S., *82, 83
 Advertising:
 Alphabetical advertisement, 909
 Frequent change in, 1515
 Hardware retailers' advertising, 1004
 Small town advertising, 1797
 Snow shovels and brooms, *716
 (See also Window display.)
 Africa, Engineering business opportunity in, 574
 Agard, C. G., *812
 Ainsworth, A. A., 81, *82
 Air compressors:
 Blaisdell self oiling, *588
 Champion copper mines, Painesdale, Mich., *427
 Air heater, Green, *274
 Air washer and humidifier, Buffalo, *1521
 Alabama Consolidated Coal & Iron Co., Annual report, 221
 Alabama iron ore investigation, 1108
 Alaska tin deposits, 1742
 Albree, Chester B., Iron Works Co., 341
 Alcohol, Free Industrial, 337, 597, 785, 960, 1196, 1754
 Alcohol vs. gasoline in explosive engines, 1843
 Allis-Chalmers Co., 265, 1621
 Additions to West Allis plant, *1245
 Electrical works at Norwood, Ohio, *2052
 Large contracts, 430
 Almond right angle drive, *965
 Altnoir, H. J., *1581
 Aluminum:
 Aluminum industry and the Hall patent, 1339
 Posno system of brazing, 683
 Production at Niagara Falls, 8
 Aluminum cables across Niagara River, *755
 Amalgamated Association scales, 1690, 1753, 1862, 1988, 1991, 2079
 Ambulance chasing lawyer, 433
 American Boiler Manufacturers' Association, 1761
 American & British Mfg. Co., Annual report, 1172
 American Can Co.'s report, 535
 American Electrochemical Society, 1178
 American Foundrymen's Association, 1678, 1685, 1847, 1902, 1916
 American Hardware Corporation, 908
 American Hardware Manufacturers' Association, 1143, 1581, 1722, 1944, 2022
 American Institute of Electrical Engineers, 962, 1831
 American Institute of Mechanical Engineers at Bethlehem, Pa., 771
 American Institute of Mining Engineers in Europe, 418, 1605, 2066
 American Iron & Steel Mfg. Co., 604
 American Radiator Co., Statement, 967
 American Railway Master Mechanics' Association, 2007
 American Society of Mechanical Engineers, 1363, 1497, 1544
 American Society for Testing Materials, 1479, 1621, 1907, 2055
 American Steel & Tube Co., 222
 American Supply and Machinery Manufacturers' Association, 971, 1037
 American Tool Works Co., 492, 569
 American Tube & Stamping Co., 764
 Amlot, Lecours & Larivière, 1880
 Angle drive, Coates', *342
 Anglegraph, *1958
 Annealing:
 Automatic, of metals, *1174
 Effect of, on steel rails, 1398
 Antirattler, Corey Quick Shift, *246

Arkansas Hardware Association map, 1951
 Arkansas Retail Hardware Association, 1724, 1948
 Armor factory, Government, 1917
 Armstrong Brothers Tool Co., 345
 Asbestos protected metal, 2035
 Asbury, C. W., *2024
 Ash handling system at power plant, 1187
 Associated Foundry Foremen, 1606
 Atha Steel Castings Co., 1287, 1543, 1621
 Atkinson, Thomas, *82, 83
 Atlanta Steel Hoop Co., 1391
 Atwater, C. G. Tests of a coke oven gas engine, 596
 Aubrey, A. J. Refractory uses of bauxite, 495
 Auctioneering by mail, 1705
 Australia:
 Iron ore resources in, 28
 Labor laws, 275
 Notes, 245, 1795
 Wolfram ore in, 1182
 Automobile shows:
 Lessons of, 351
 New York, 285, 351, 353
 Automobile testing laboratory at Purdue University, 1020
 Automobiles:
 Dust and motor car design, 25
 Experience with trucks, 1108
 More business or more pleasure. By M. C. Krarup, 493
 Motor vehicles for business work. By M. C. Krarup, 765
 Omnibus in London, 419
 Statistics, 973
 Test of gasoline consumption, 1543
 Truck, Four-wheel drive, *576

B.

Backert, A. O. Chicago iron trade in 1905, 106
 Backstrom-Smith steam turbine, *1680
 Badger plate bending rolls, *757
 Baird Machine Co., 269
 Baker, J. F., *917
 Ball, Pneumatic golf, *1957
 Ball bearing experiments, 533
 Banking laws, National, Amendment, 1550
 Bankruptcy law, Federal, 270, 350, 762, 970
 Bar iron for the Navy Department, 2066
 Barber, D. F., *934, *1149
 Bare, F. A., *917
 Barges, Steel, on the Ohio and Mississippi rivers. By R. J. Donovan, 688
 Barkley, Davis, *629
 Barnes, C. W., *543
 Barr, J. F., *736
 Bartlett, A. C., Address by and portrait, *546
 Bassett, G. A., *812
 Bassett's "New Haven Almanack," *318
 Battle ship contest, 1750
 Battle ship repair shops, Efficiency of, 1622
 Battle ships, Proposals for Michigan and South Carolina, 2067
 Baush Machine Tool Co., 1465
 Bauxite, Refractory uses of. By A. J. Aubrey, 494
 Bayles, James C., 71
 Becker-Brainard plain milling machine, *671
 Belgian engineers on American practice, 285
 Belgium:
 American hardware in, 1947
 Pig iron conditions in, 680
 Belknap, W. R. Louisville fifty years ago, 161
 Belknap Hardware & Mfg. Co., History, *243
 Bell, David, Engineering works, 1539

Bending rolls, Niles motor driven, *1606
 Benefiel, J. O. Gas fired steam boilers, *352
 Bennett, Irby, *2025
 Berkshire Mfg. Co., 2070
 Besby disk grinder, *2062
 Bessemer Pig Iron Association, 2065
 Best, T. J. Manufacture of soil pipes and fittings, 2075
 Bethlehem Iron Co.'s bonds, 436
 Bethlehem Steel Corporation, Report, 1479
 Bigelow, S. A. Fifty years in the hardware business, 150
 Billings & Spencer, 508
 Bills, Old hardware, 828, 931, 1146
 Bindley, Edwin, Biographical sketch of, *1000
 Birch suspension speed drill, *957
 Birdsey, E. C., *813
 Bisbee copper mine pumps, 1271
 Blaisdell Machinery Co., 588
 Blast furnace charging apparatus, *505, *1679
 Blast furnace gas, Electric power from. By A. G. McKee, 282
 Blast furnaces:
 Anthracite, Condition of, 1488
 Furnace bottoms, Air, in malleable practice, 1273
 Gayley dry air process, 771. By C. A. Meissner, 872, 956, 1131
 History, 59
 New, 1343
 Loss of air in blowing furnaces. By Otto Jaschke, 1692
 Obstructions, Use of oxygen in removing. By C. de Schwarz, 1608
 Record output, 1481
 Status of the merchant blast furnace, 1550
 Use of water to lower moisture. By A. Steinbart, *1032, 1682
 Bliss, E. W., Co., 199, 257, 867, 1329, 1754
 Block, Waterbury double horizontal bull, *1758
 Bloom shear, German electric, *578
 Blowers:
 Champion electric blacksmith, *1249
 Piqua positive, *1908
 Sturtevant high pressure, *406
 Boats, Small power, Federal regulation of, 1278, 1780
 Bogardus, W. P., *1148
 Evolution of the hardware store, 153
 Boggs-Howland Co., 1077
 Boiler construction and nickel steel. By G. B. Waterhouse, 490
 Boiler lug, Scully pressed steel, *201
 Boiler shop for college men, 8
 Boilers, Gas fired, 28, *352
 Bole, W. A. Foundry practice, 589
 Bolinger, F. P., *731
 Bolt, Crescent expansion, *2036
 Bolt clipper and shear, Victor combination, *1009
 Bolt driver, Armstrong, *345
 Book reviews:
 Copper manual, 1904
 Downing's U. S. Customs Tariff, 1575
 Elementary Practical Metallurgy of Iron and Steel. By Percy Longmuir, 560
 Eminent Engineers, 2071
 Forty Years An Advertising Agent. By G. P. Rowell, 506
 Gas, Gasoline and Oil Engines. By G. D. Hiscox, 1408
 Glue, Gelatine and Allied Products. By T. Lambert, 455
 Iron and Steel and Other Alloys. By H. M. Howe, 1483
 Iron and Steel Manufacture. By W. Macfarlane, 1767
 Machine Shop Construction. By O. E. Perrigo, 356
 Manual of Statistics, 1919

Book reviews (continued):

Manufacture of Concrete Blocks. By H. H. Rice, 1919
 Metallurgical Calculations. By J. W. Richards, 1767
 Mineral Industry, 1904, 455
 Morton Memorial Volume, 1638
 New York Railroad Commissioners, 1919
 Panama to Patagonia. By C. M. Pepper, 1408
 Practical Pattern Making. By F. W. Barrows, 455
 Principles of Roll Turning. By Emil Kirchberg, 1638
 Producer Gas and Gas Producers, By S. S. Wyer, 1288
 Railroad Manual, Appendix and Diary, 1767
 Report on Operation of Coal Testing Plant at Louisiana Purchase Exposition, 1345
 Russell, W. Davenport, 356
 Ryland's Directory, 1059
 Steel Mill Buildings. By M. S. Ketchum, 1059
 Suction Gas. By O. H. Haenssger, 356
 Tables for the Use of Blacksmiths and Forgers. By John Watson, 1767
 Valve Gears for Steam Engines. By C. H. Peabody, 1575
 Bope, H. P. Steel Industry of Pittsburgh and Wheeling, 284
 Boring machines:
 German armor plate, milling and, *575
 Gisholt, *1605
 Hoefler vertical drilling and, *1536
 Newton portable, *1834
 Bottle coolers, Twentieth Century, *1378
 Boutwell, R. M., Portrait of, *383, *2107
 Bowers, J. H., *635
 Bradish, J. H., *826
 Bragg, C. F., Portrait of, *353
 Brake, Magnetic, *417
 Brass castings, Demand for high grade, 1468
 Bread makers:
 Dixie improved, *322
 Prisco, *2168
 Breckenridge, R. J., *730
 Brick consolidation, 1287
 Brickner Machine Co., 1983
 Bridge charges at St. Louis, 113
 Bridges:
 Manhattan:
 Basic or acid steel, 1275
 Contract, 113, 1105
 Niagara Falls, 1137
 Scherzer rolling lift bridge, 1178
 Briquetting of fuels and minerals. By G. J. Mashek, *1330
 Bristol, W. H. A low resistance thermoelectric pyrometer, *1610
 Bristol Co., 1401
 Broom holder, Dandy, *1800
 Brown, H. S. The chemist in the machine shop, *1746
 Brown-Corliss Engine Co., 770
 Brown recording revolution indicator, *1261
 Buck, G. W., *820
 Bucket, Self dipping well, *1008
 Buffalo Crucible Casting Co., 667
 Buffalo Forge Co., 769, 1108, 1321, 1532, 1763
 Buffalo & Susquehanna Iron Co., 428
 Building, American and British: comparative merits, 275
 Building materials, Government investigation of, 759
 Building movement, A remarkable, 512
 Building record in 1905, 343
 Buildings:
 Manufacturing buildings in cities. By W. S. Timmis, *29
 Reinforced concrete buildings, *29
 San Francisco disaster, *1815
 Sheet iron, 2088
 Burke Machinery Co., 1323
 Burr, S. D. V.:
 New York rubbish incinerating plant, *496
 Projected subway lines in Greater New York, *410

Burr, S. D. V. (continued):

Troubles with East River tunnels, 1687
 Burtis, R. M., *640
 Bush, E. M., *718, *1148
 Business methods:
 Business success. By A. C. Bartlett, 546
 Checking up invoices, Rubber stamp in, 1301
 Contracts, Integrity of, 2028, 2029
 Country hardware store, 817
 Delivery record, Manson's, 1652
 Expenses, Meeting increased, 2026
 Factory cost and business methods, 1079, 1153, 1225, 1306, 1372, 1585
 Hints in building up a retail hardware business, 319
 Investment of disputed territory, *468
 Lack of linguists in business, 1765
 Mail order problem, 1438
 Manufacturing cost, What is a? By C. Carington, 197
 National control of national business questions, 432
 Order sheets, 1079
 Premium system, A successful, 1306, 1372
 Selling repair parts, 2072
 Specifications, Unintelligible, 554
 Sporting goods, Sale of, 1443
 Syndicate buying for retail merchants, 1302
 (See also Advertising; Letters from the trade; Trade winning methods; Window display.)
 Business situation:
 Capital and small industries, 1115
 Factors in the situation, 880
 Financial position of large companies, 99
 Gary's views on prospects, 1117
 Looking forward, 98
 Money market and general business, 99
 Busse, W. H., *641
 Butler Brothers, 1438, 1583
 Butterfield, C. L., *385

C.

Cableways:

Leschen aerial, for conveying ore, 1973, *1975
 Palmers' docks, *678
 Caking fine coal for coking. By Alfred Ernst, 663
 Caldwell, H. C. Permanent molds and carbon cores, 266
 Caldwell, H. W., & Son Co.'s foundry, *1093
 California Hardware Association, 1370
 California State Retail Hardware Association, 1070, 1222
 Cam, Cutting irregular, with aid of air drill, *501
 Cambria Forge Co., 1534
 Cambria Steel Co., Annual report, 1060
 Can tops, Wired, Press for making, *257
 Canada:
 Capital, Uses for, 961
 Electric smelting, 1898, 1990
 Iron and steel bounties, 1752
 Iron and steel projects, 1168
 Iron and steel traffic, 517, 1677
 Iron ore resources, 670
 Manufacturing developments in, 416
 Niagara and Ontario power users, 1338
 Ontario's Hydroelectric Commission, 756
 Pig iron production in 1905, 775
 Prosperity of 1905, 105, 314
 Protection and upbuilding of towns, 756
 Rail duty, 1182
 Rail mills and Canadian demand, 584, 1464
 Railroad building campaign, 960
 Steel bounty, 2064
 Steel industry inadequate, 268
 Steel works, Increasing capacity, 1464
 Tariff complications, 350
 Tariff revision, 431, 502, 570, 668, 861, 1183
 Tin plate, American in, 1411
 Trade policy, A contrast in, 1916

Canals:

Cape Cod, 1763
 Electric haulage. By F. C. Perkins, *567
 Panama, Government management, 880
 Capital and small industries, 1115
 Capron, A. J. Compression of steel ingots in the mold, 1762
 Car famine on German railroads, 427
 Car statistics for 1905, 221
 Car supply, Ways and means of maintaining, 802
 Car wheels:
 Continuous casting of, *1
 Kalamazoo, *428
 Pennsylvania molding process for casting, 1542
 Cars:
 Higher standard for, 780
 100-ton flat, *1621
 Ralston side dumping, *1019
 Slag car, *1389
 Steel car industry, Extent of, 1551
 Steel, Heavy tonnage of, 351
 Strang independent electric car, *681
 Underframe, Ralston steel, *775
 Wills' steel, *1911
 Carbon:
 Color estimation and the influence of copper. By G. B. Waterhouse, 1179
 Standard determination of, 1902
 Carbon cores and permanent molds. By H. C. Caldwell, 266
 Carbonic acid as a cause of rust, 1912
 Carington, C. What is a manufacturing cost?
 Carlin's Sons, Thomas, Co., 1122
 Carnegie relief fund, 335
 Carnegie Steel Co., Gas engines and blast furnace gas, 1567
 Carnegie Technical School's plant, *1601
 Carpenter Foundry Co., 183
 Carter, C. B., *2025
 Cartridge repair mill, *1801
 Case Mfg. Co., 682
 Casey, C. H., *929
 Caslor, John, *1721
 Cast iron. (See Iron and steel.)
 Cast iron pipe industry, 1915
 Casting:
 Car wheels, *1
 Locomotive cylinders in steel, *680
 Casting machine, Illingworth, *761, 1263
 Castings:
 Making repair, *950
 Production of steel castings, 280
 Remarkable steel, *1471
 Strength and softness in the same casting, 589, 686
 Tod engine, *1540
 Caswell, E. A. Lead and tin in 1905, 18
 Catalogue, Proposed, of the Western Heavy Hardware Jobbers, 382, 471, 552, 626, 715, 931
 Catalogue house competition, 924, 932, 1152
 Catalogue houses, Legislation favoring, 1510, 1579
 Catalogue sheets, Standard size of, 265
 Catalogues, Uniform size loose leaf, 2023
 Cement industry in 1905, 1334
 Cement manufacture, Producer gas in, *953
 Central American notes, 774, 1169, 1406, 1833
 Central Foundry Co., 1543
 Central Iron & Steel Co.'s plate mills at Harrisburg, Pa., *44
 Chain making, Lelong process of, *855
 Champion Blower & Forge Co., 1249
 Chandler, F. A., *933
 Chandler, Frank, *1300
 Chapman, Edwin N., 75
 Chapman, John L., *238
 Chemist, The, in the machine shop. By H. S. Brown, *1746
 Chester, Pa., Steel foundry activity at, 408
 Chicago iron trade in 1905. By A. O. Backert, 106
 Chicago Metal Trades Association, 1041
 Chicago municipal ownership, 1269
 Chicago Pneumatic Tool Co., 599, 1459

China, Future demand from, 969
 Christopher, J. G., Address by, 1040
 Chromium in steel, Determination of.
 By Edward Herms, 667
 Chucks:
 Jaw, Pinkerton automatic revolving,
 *1178
 Lightning spring friction, *1613
 Church, W. A., *813
 Cincinnati Machine Tool Co., 13
 Cincinnati Metal Trades Association,
 1861
 Cincinnati Planer Co., 763
 Cincinnati Punch & Shear Co., 1469,
 1534
 Cincinnati Shaper Co., 415
 Cinder top, Livermann, 205
 Cleveland Cliffs Iron Co., 354
 Cleveland meetings, 1651
 Clifford, L. C., *728
 Clock, Argus watchman's, *476
 Clutch, Hulley friction, *1617
 Coal, Caking for coking. By Alfred
 Ernst, 663
 Coal and coke exports in 1905, 1178
 Coal handling plants:
 Central Iron & Steel Co., *52
 Hulett handlers at Duluth, *1669
 Long Island City, *1187
 Coal miners' convention, 285, 356, 967,
 1548
 Coal production of Alabama, 2054
 Coal strike possibilities, 535. By F. E.
 Saward, 582, 973, 1043, 1047,
 1119, 1216, 1288, 1343
 Coal tar jubilee, 1814
 Coal trade. By F. E. Saward, 259
 Coal trade regulation in England, 1100
 Coates Clipper Co., 1248, 1678
 Coatings, Testing of protective, 1781.
 Coes, Loring, Reminiscent talk with,
 160
 Coffee percolator, Meteor, *1234
 Coke:
 Connellsville, trade in 1905, 278
 Connellsville values, 1411
 Foundry tests of, 2071
 Making in the U. S. By E. W. Parker,
 9.
 Rates on, to Chicago, 1552
 Specifications, 2059
 Coke ovens:
 By-product, List of, 11
 Caking fine coal for coking. By Al-
 fred Ernst, 663
 Otto by-product, *659
 Collapsing pressures of Bessemer steel
 lap welded tubes. By R. T. Stew-
 art, *1472
 Colorado association map, 632
 Colorado Fuel & Iron Co., 805, 1176
 Colorado Retail Hardware Association,
 628
 Combination tool, Detroit, *423
 Concrete:
 Forms of reinforcement, *193, 1323
 Waterproofing for, 183
 Condenser, Heisler induced circulation
 counter current, *1333
 Conduit, Sectional steam pipe, *1910
 Connellsville coke trade in 1905, 278
 Connecticut Retail Hardware Associa-
 tion, 812
 Consular service, 1263, 1739
 Contract shop, Passing of the, 204
 Contracts, Integrity of. By Alfred
 Sang, C. H. Ireland, 2028, 2029
 Cook chest, Prasser Magic, *1445
 Cooper, W. G. The iron ores of Georgia,
 100.
 Cooper Hewitt mercury vapor lamp for
 industrial lighting, 1757
 Cope, George W., *73, 74
 Copper alloy for the manufacture of
 brass valves, 1607
 Copper and pig iron consumption, Ratio
 of, 1259
 Copper mining in 1905. By H. J. Ste-
 vens, 114
 Copper production compared with that
 of pig iron, 2065
 Copper production in 1904, 1409
 Corbin, A. B., *630
 Corbin, Philip, Reminiscences of, *139
 Core coning machine, Wadsworth foot
 power, *1021
 Corey, M. L., *718, *1149

Cormick, H. G., *841
 Corporate names, Misfit, 1552
 Corrosion, Electrolytic, of structural
 steel, 1756
 Corrosion of fence wire, 207
 Corrosion of steel vs. iron, 1924
 Corrosion of wrought iron and steel. By
 H. M. Howe, 2047
 Corrugating machine for metal gaskets,
 Niagara, *1620
 Cost of manufacture. By C. Carington,
 197
 Countershafts, Mossberg pull, *1258
 Couplings:
 Pelton flexible, *1101
 Rolling mill drive construction, *1250
 Steam and air drill coupling, *1447
 Cowing, W. T., *929
 Cranes:
 Case electric traveling jib crane, *682
 Electric, in the foundry. By Harry
 Lawyer, 1845
 French electric traveling gantry, *331
 Frevert hand-power travelling crane,
 *1328
 Light traveling hand crane, *508
 Niles electric gantry, *39
 Shaw electric ladle crane, *24
 Crank shaper, Eberhardt, *42
 Cream and egg whip, Silver blade, *1592
 Creed, W. B., *719.
 Crescent Machine Co., 1173
 Crosby, L. B., *812
 Cultivator, New Century, *248
 Cupola, Improvement in melting in, 355
 Customs. (See Tariff.)
 Cutting off machine, Espen-Lucas cold
 saw, *1831
 Cutting off tool, Billings and Spencer,
 *508.
 Cylinder grinder, Heald, *1264

D.

Dam, New Croton, 1024
 Dana Mfg. Co., 1074
 Davenport, A. W., *813
 Davis, E. L., *935
 Davis, J. M., & Sons, Oakland, Md., 1223
 Davis, W. P., Machine Co., 419
 Dayton, Frank, *1581
 Deemer, S. S. Way to prevent strikes,
 686
 Degner, Albert, *736
 Delaware Hardware Association, 909
 Delivery record, Manson's, 244
 Derrick engine, Three-drum tandem
 Lidgerwood, *1987
 Desulphurizing process, Saniter, 205
 Detroit Power Specialty Co., 584
 Detroit Tool Co., 423
 Dewey, C. E., *641
 Diamond Portland Cement Co., *953
 Diamond State-Tidewater-Chapman
 merger proposed, 1047
 Dickie, G. W. Engineering works on
 the Pacific Coast, 1466
 Dietz, R. E., Co., 2105
 Digby, J. E., *634
 Directory, Shop, 1990
 Disk grinder, Besly, *2062
 Disk sharpener, Murray, *1320
 Disston, Henry, & Sons, Discount sheet,
 133
 Disston plant for the electrical melting
 of steel, *1811
 Dividers, Lodi, *249
 Dog, Hill taper milling, *1179
 Dominion Iron & Steel Co., 221, 2095
 Donner, P. E., and a new steel plant,
 1983
 Donovan, R. J. Steel barges on the
 Ohio and Mississippi rivers, 688
 Door catches:
 Ideal automatic, *743
 Steel latch for barn, *2109
 Universal, *321
 Door hanger, Myers' adjustable, *1010
 Door spring, Geran, *845
 Douglas, A. W. Effect of combinations
 and consolidations upon the hard-
 ware trade, 241
 Doty, J. F., *728
 Downey, R. M. Profit sharing as a
 peace and profit maker, 1106
 Drawing press, Bliss triple action, *867
 Drill rods in rack, *2105

Drilling attachment, Reed multiple,
 *421, *1683
 Drilling machines:
 American radial, *569
 Bausch multi-spindle, 1465
 Cincinnati gang drill, *13
 Fox light drills, *1537
 Hofer special multiple spindle, *1396
 Niles four-spindle, *1814
 Thor pneumatic, *1675
 Drills:
 Birch suspension speed, *957
 Single speed electric, *1335
 Driving rolling mills, methods of, *865
 Drop forging industry, Expansion in,
 1689
 Dry blast:
 A new development in. By A. Stein-
 bart, *1032
 Gayley. By C. A. Meissner, 771, 872,
 956, 1131
 Drying systems, 1993
 Dudley, R. M. Hardware trade of the
 South, 154
 Duerre, G. F., *928
 Dunlap, O. E.:
 Canadian Niagara development, *753
 Comparison of Niagara power plants,
 *1165
 Dunlop, F. B., *2024
 Duquesne blast furnace record, 1261
 Dyblie reversing valve, *665
 Dynamometer, Recording transmission,
 at Worcester, *778

E.

Eastern Pig Iron Association, 1748
 Eberhardt Brothers Machine Co., 42
 Education:
 Compulsory, in the shops, 281
 Need of a practical. By T. D. West,
 1847
 Eight-hour bill, 1768, 1837
 Electric canal haulage. By F. C. Perk-
 ins, *567
 Electric Controller & Supply Co., 417
 Electric drives in Swedish rolling mills,
 1830
 Electric furnace, *1811
 Electric furnace processes, 267
 Electric iron smelting at the Sault, 690
 Electric lamps, Standard direct current,
 *320
 Electric motor drives, Firth-Sterling
 Steel Co., *1737
 Electric motors:
 Lincoln variable speed, *776
 Motors for roll trains, 1193
 Sprague, *200
 Westinghouse auxiliary pole, *877
 Westinghouse small power, *1007
 Electric power:
 Buffalo terminal from Niagara sup-
 ply, 1910
 Long Island City, *1184, *1254
 Electric power from blast furnace gas.
 By A. G. McKee, 282
 Electric power from rubbish incinerating
 plant. By S. D. V. Burr, *496
 Electric smelting:
 Canada, 1898, 1990
 Portland, Ore., 23
 Success of, 797
 Electrical work, Progress in, 56, 100
 Electroalvanizing. By H. I. White,
 260; E. S. Mowry, 352, 514, 882
 Ellis, C. A., *719
 Ellis, F. A., Jr., *630
 Ellsworth, F. B.:
 Advice for salesmen, 1374
 Necessary expenses of a salesman,
 2104
 Emery, H. F., *542
 Emery wheel dresser, *2036
 Emery wheel grinder, Coates, *2110
 Empire Steel & Iron Co., 965, 1263
 Engelhardt, G. A., *841
 Engineering Agency, Chicago, 1532
 Engineers' commissions, R. W. Raymond
 on, 1978
 Engines:
 Alcohol vs. gasoline in explosive en-
 gines, 1843
 Buffalo cross compound, *1532
 Combustion engine in torpedo boats,
 594

Engines (continued):

- Mietz & Weis oil engine, *878
 Strang oil engine, *191
 Sturtevant vertical, *506
 Test of engines in New York Subway power house, *864
 (See also Gas engines.)
 English, Walter C., *77, 81
 Ernst, Alfred. Caking fine coal for coking, 663
 Ernst, L. J., *826
 Ernst Wiener Co.'s new shops, *1896
 Erwin, S. L. Address by and portrait, *464
 Esco Mfg. Co., 2045
 Eshleman, B. F., 166
 Espen-Lucas Machine Works, 1831
 Evenson, E. W., *386, *1799
 Excelsior Tool & Machine Co., 859
 Exhibits at hardware conventions, 1147
 Export trade:
 Leading countries, 1616
 Remarkable showing in, 351
 (See also Iron and steel trade.)

F.

- Factory cost and business methods, 1079, 1153, 1225, 1306, 1372, 1585
 Factory education, 260
 Factory furniture, Lyon, *1760
 Factory inspection in Pennsylvania, 2069
 Falkenau, Arthur. The selection of material for hydraulic machinery, 1096
 Falls Rivet & Machine Co., 1021
 Famous Mfg. Co., 1397
 Fans:
 Mine ventilating, *1260
 Westinghouse electric, 586
 Feather River electric power development, 784
 Fence posts:
 Bruley steel, *1592
 Pyramid, *2109
 Steel angle, *1232
 Fence wire, Corrosion of, 207
 Fencing:
 Galvanized wire, for railroads, 1262
 Sale of woven wire, 391
 Selling iron, Profit for hardwaremen in, 1876, 1946
 Fernley, T. James. The National Hardware Association, 157
 Ferres, J. G., *827
 Ferrosilicon:
 Powdered, in the foundry, 882
 Use of, in the foundry, 586, 782, 882, 1044
 Field, H. E. Molding sand, 951
 Filing chart, Schmidt simplex, 1144
 Finance. (See Business situation.)
 Findley, Alvin I., *73, 74
 Fireproofed steel construction. By William Sorg Smith, 1609
 Firth-Sterling Steel Co. Electric driving of machine tools, *1737
 Fishing tackle in the hardware store, 1227
 Floor spring hinge, Columbian, *247
 Flour bin truck, *1592
 Fluctuations in metal prices from 1894 to 1906, 344
 Fluctuations in the prices of iron and steel products, 1897-1905, 192, Sup.
 Flue cleaning machine, Ryerson, *271
 Fogarty detachable rim gear, *2061
 Foley, J. B., *827
 Follansbee Brothers Co., 355
 Food slicer, Sterling, *744
 Ford, Ed., on trade questions, 1080, 1145, 1232, 1302, 1373, 1586, 1724
 Forest of Dean iron mine in Orange County, N. Y., *1972
 Forest preservation, Public interest in, 513
 Forges:
 Buffalo, *1108
 Buffalo compressed air, *1763
 Burke oil, *1323
 Forging press, Bliss double crank, *199
 Foundries:
 Caldwell, H. W., & Son Co., *1093
 Foundry on a chemical basis. By R. Meeks, 20

Foundries (continued):

- Foundry practice. By W. A. Bole, 589
 Legislative meddling with, in Massachusetts, 781
 Modern steel, of the square type, *1170
 Steel, Increased capacity, 280
 Foundry iron prices in Chicago, 512
 Foundry labor problem, 1624, 1764, 1771, 1991
 (See also Iron molders.)
 Foundry tests of coke, 2071
 Foundry trade school, 509, 1482
 Fouts, C. C., *918
 Fox Machine Co., 1110, 1537
 Frame, C. B., *719
 Frame clamp, Hold Fast, *1233
 France, Iron and steel production in 1905, 1536
 Francis Reed Co., 421
 Franklin bicentennial, 334
 Franklin Institute, 419
 Frederick, J. C., *820
 Freight classification of scrap, 1177
 Freight rates on pig iron from Southern furnaces, 762
 Frevert Machinery Co., 1328
 Fridaker, J. A., *386
 Frier, Taylor, *833
 Fudaker, J. A., *1799
 Fuel, Buying, on analysis, 957
 Fuel testing in Illinois, 1539
 Fuels, Government investigation of, 759, 972
 Fuhr, J. C., *918
 Funnels:
 Breeze, *475
 Index, *1155

G.

- Gaebler, Walter, *2106
 Galvanizing, Electrolytic. By H. I. White, 260
 Gardner Machine Co., 1109
 Gardner universal mill, *1113
 Garland, Robert, *2024
 Gary, E. H., Testimony of, on prices of steel, 1324
 Gas:
 American, and the sliding scale, 595
 Prices in England, 33
 Producer gas in Portland cement manufacture, *953
 Water gas, Use of, in the arts, *336
 Gas cleaning by the use of steam, *1838
 Gas engineering, Modern problems in. By F. B. Wheeler, 340
 Gas engines:
 Blast furnace gas used by Carnegie Steel Co., 1567
 Development of large engines. By C. E. Sargent, 954
 Gilson small gasoline engine, *1900
 Heavy duty gas engines, Carnegie Technical Schools, *1601
 Norton Emery Wheel Co.'s plant, 1532
 Tests of a coke oven gas engine. By C. G. Atwater, 596
 Tests of 500 H.-P. coke oven engine, 422
 Gas fired steam boilers, 28, *352
 Gas furnace, Stewart, *962
 Gas lighter, Matchless distance, *1083
 Gas plants of Chicago to be centralized, 1031
 Gas power economics. By F. E. Junge, 1392, 1462
 Gas producer, Endurance test of, by R. H. Fernald, 1459
 Gas producers for power. By Julius Wile, 869
 Gases, Waste, from coke ovens and blast furnaces, Utilization of, 2063
 Gauge and cutter, Exacto packing, *1957
 Gay, H. M., 1590
 Gayley dry air blast. By C. A. Meissner, 771, 872, 956, 1131
 Gear cutters:
 Gleason bevel gear generator, *1967
 Standard automatic, *1181
 Gear wheel, Fogarty, *2061
 General Electric Co.:
 Annual report, 1619
 San Francisco offices, 1905
 Georgia iron ores, 100

Germany:

- American manufacturer's observations, 1919
 American small tools for, 1799
 Iron and steel production, 1267
 Iron trade, 983
 Machinery trade, 867
 Mineral and metal production in 1905, 1504
 Postponement of high German duties, 780
 Steel casting syndicates, 884
 Steel production in 1905, 1348, 1497
 Tariff relations, 276, 856, 1780
 Trade pool investigation, 1643
 Gewalt, Louis, *929
 Giessing, Fred., *841
 Gilbert, Edwin, Biographical sketch of, *990
 Gilfillan, S. G., *2025
 Gilson Mfg. Co., 1900
 Gisholt Machine Co., 1605
 Gladding, N. A., 164
 Gleason bevel gear generator, *1967
 Gnadt, H. E., *841
 Goff, H. J., *1581
 Gold galvanizing, *1980
 Goodell, D. H., 165
 Gormley, W. T., *842
 Government purchases, 230, 304, 372, 455, 533, 618, 707, 802, 901, 902, 1065, 1137, 1215, 1293, 1361, 1432, 1572, 1643, 1710, 1785, 1867, 1939, 2012, 2093
 Graphite crucibles, Use and abuse of, 1401
 Grass catcher, *844
 Grate, Hawley traveling, *1984
 Gray, G. M., *918
 Great Britain:
 Bessemer steel in Great Britain in 1905, 993
 Iron and steel exports and imports in 1905, 375
 Iron trade of 1905, 1765
 Labor legislation, 1739
 Naval innovations, 1116
 Parliament, New, 101
 Pig iron output in 1905, 710
 Trade dispute laws, 968, 1114, 1191
 Tube combine, 1250
 Green, J. A. Southern pig iron market in 1905, 187
 Green Fuel Economizer Co., 274
 Greenaway Co., 1749, 1906
 Grinding attachment, Coates, *1248
 Grinding machines:
 Besly double head disk grinder, *2062
 Coates lathe, *1678
 Electric bench grinder, *1329
 Gardner improved double disk, *1109
 Heald cylinder grinder, *1264
 Heald ring and surface, *1740
 Phoenix disk grinder, *1813
 Sterling tool grinder, *273
 Tindel high duty saw grinder, *1538
 Groover, Niagara heavy power, *1335
 Guarantee, What is a? 828
 Guatemala, Larger trade with, 768
 Gun cleaners, Criss Cross, *558
 Guns, Marlin, *248

H.

- Haas, C. E., *731
 Hacker, Frank, *735
 Hahn, W. H., *833
 Halcomb Steel Co., 199
 Hall, H. J., *736, *1149
 Halsey, F. A., and S. S. Dale, Testimonial to, 1216
 Hambly, J. R., *1721
 Hamilton Electric Light & Cataract Power Co., 587
 Hammers:
 Bell improved steam, *1539
 Magnet horseshoe, 1231
 Thor pneumatic, *1675
 Hanger, Nassau steel, *1236
 Harbison-Walker Refractories Co., 299
 Hardware trade, 127, 232, 306, 376, 457, 538, 621, 711, 806, 906, 994, 1067, 1139, 1218, 1295, 1364, 1434, 1505, 1576, 1646, 1712, 1788, 1869, 1941, 2014, 2096
 Haw, George, Jr., *2106
 Hawaii, Trade in, 1718

Household hardware, List of, 1653
 Hardware association programme advertising, 314, 554
 Hardware bills, Old, 828, 931, 1146
 Hardware prices in 1867, 828, 931
 Hardware store, Evolution of the. By W. P. Bogardus, 153
 Hardware trade:
 Bigelow, S. A., on fifty years in the hardware business, 150
 Chicago market in 1905, 313
 Corbin, Philip, Reminiscences of, 139
 Effect of combinations and consolidations, 241
 History of, 61
 Fifty years' review, 134
 Jobbing trade fifty years ago, 148
 Missionary's point of view, 151
 New Britain fifty years ago, 142
 New York in the fifties, 144
 Retrospect, A, 242
 San Francisco, Cal., 162
 Shmons, E. C., on half a century in hardware, 145
 Southern trade, 154
 Success in building up a retail business, 319
 Harrington, Edwin, Son & Co., 1391
 Hart, William H. New Britain half a century ago, *142
 Hartke, George, *918
 Hartman, J. M. The Luermann cinder tap, 205
 Hawkins, E. D., *1002
 Hawley travelling grate, *1984
 Hay carrier, Meadow King, *557
 Hay carrier and fork, *1084
 Hayden, Brace. Hardware progress in fifty years, 162
 Heald Machine Co., 1264, 1740
 Heater, Green, *274
 Heisler Mfg. Co., 1333
 Helgesen, H. T., *544
 Heller, Paul E. The early manufacture of files, 157
 Hendey Machine Co., 1098
 Herms, Edward. Determination of chromium in steel, 667
 High Duty Saw & Tool Co., 1538
 Hill, Orton, 1304
 Hill iron ore properties. By D. E. Woodbridge, 26, 280
 Hill taper milling dog, *1179
 Hilles & Jones Co., 422
 Hinge, American grate, *1956
 Hobson, Thomas:
 Philadelphia iron trade in 1905, 110
 Reminiscences by, 75, *77
 Hoe, Self cleaning, *474
 Hofer Mfg. Co., 1396, 1536
 Hoffman, Louis, 161
 Hoisting engine, Three-drum tandem Lidgerwood, *1987
 Hoists:
 Electric, for ore, 1895
 Peerless hand, *1391
 Sprague winding drum, *956
 Yale & Towne electric trolley, *1744
 Hollowell, W. D., *827
 Hood, E. K. Columbus impeller pump, *1756
 Hook, Smith snag, *743
 Hoover & Mason steamer and unloader, *14
 Hose connector, Pittsburgh, *473
 Hose coupling, Snap, *1882
 Hot Springs conventions, 1581, 1944
 Houghtaling, Elmore, *929
 Howard, J. E. The range in tensile properties of a low carbon steel, 1404
 Howe, H. M.:
 Relative corrosion of wrought iron and steel, 2047
 Saniter desulphurizing process, 205
 Howe, J. F., *635
 Howell, E. N. What does it cost a retailer to do business? 1947
 Hudson Iron Co., 1972
 Huhlein, C. F., Address by and portrait, *464, 465
 Hulett coal handlers at Duluth, *1669
 Hulley Foundry & Machine Works, 1617
 Humphries, A. W., *1720
 Hunt, A. G., *2106
 Hunter, J. B., *933
 Hutton, F. R., Resignation of, 1215

Hydraulic machinery, Selection of material for. By Arthur Falkenau, 1096

I.

Illinois and Indiana coal consolidation, 613
 Illinois Hardware Association map, 840
 Illinois Retail Hardware Association, 388, 714, 834
 Illinois Steel Co., 536, 1197, 1200
 Independent ore companies active, 1918
 Independent Pneumatic Tool Co., 1675, 1978
 India, Large hydro-electric power installation, 414
 Indiana Hardware Association map, 725
 Indiana Retail Hardware Association, 718
 Indiana Steel Co.'s new plant, 2006
 Indicator, Brown recording revolution, *1261
 Industrial schools, State aid to, 1340
 Ingalls, F. W., *918
 Ingersoll Milling Machine Co., 1457
 Inland Empire Implement and Hardware Association, 385, 1799, 2019, 2099
 Inlaying metallic surfaces, 1744
 Insurance, Mutual fire, 466, 736, 1950
 International Association for Testing Materials, 1907
 International Conference of American States, 298
 International Waterways Commission's report, 1167
 Iowa Hardware Association map, 733
 Iowa Retail Hardware Dealers' Association, 237, 728
 Ireland, C. H., on the integrity of contracts, 2029
 Iron Age:
 Beginnings of, 66
 Branch offices, 75
 Changes in, 70
 Directory published, 1764, 1793
 Hardware department, 64
 Index published, 202
 Printing plant, *84
 Semicentennial of, 55, 66, 75
 Staff of, 1906, *72
 Iron and industrial stocks, 220, 298, 368, 448, 529, 612, 701, 797, 896, 985, 1058, 1130, 1209, 1286, 1356, 1426, 1497, 1568, 1637, 1704, 1779, 1861, 1932, 2005, 2088
 Iron and metal trades, 116, 213, 289, 360, 440, 522, 605, 694, 789, 889, 977, 1051, 1123, 1201, 1279, 1349, 1418, 1489, 1559, 1629, 1696, 1772, 1853, 1925, 1998, 2080
 Iron and steel:
 Analyses of lake ore for 1905, 1829
 Changes during the cooling of cast iron. By Thomas Turner, *1671
 Chill in cast iron, 1766
 Corrodibility of malleable castings in the ground, 568
 Corrosion of steel vs. iron, 1924
 Corrosion of wrought iron and steel. By H. M. Howe, 2047
 Corrosion, Investigation proposed, 2072
 Manufacture and characteristics of wrought iron, 966
 Silicon-manganese pig iron determination, 871
 Strength of cast iron machine parts, 1903
 (See also Steel.)
 Iron and Steel Institute, 1395
 Iron and steel production:
 Anthracite strike and pig iron production, 1043
 Basic pig iron and basic open hearth steel, 1114
 Bessemer steel in 1905, 514
 Bessemer steel in Great Britain in 1905, 993
 Decreasing production, 209
 German pig iron, 599
 Independent ore companies active, 1918
 Lake district, 783, 904, 1132, 1260, 1470, 1574
 Lake ore, Active exploration for, 1759
 Lake Superior ore values, Enhancement of, 1340

Iron and steel production (continued):
 March pig iron production, 1269, 1275
 March records, 1343
 Mountain iron mine, 1841
 New York State as a producer and consumer of pig iron, 581
 Open hearth production greatly increased, 1036, 1042
 Output in 1905, 209
 Per capita consumption of iron in 1905, 685
 Per capita production and consumption of pig iron, 881
 Pig iron, increasing, 1921
 Pig iron in 1905, 510
 Pig iron figures, Significant features of, 1622
 Pig iron production slightly less, 1555
 Pig iron stationary, 974
 Pig iron production and copper compared, 2065
 Pittsburgh vein, 1195
 Rails and Bessemer ingots in 1905, 509
 Ratio of copper and pig iron production, 1259
 Record in pig iron, 601
 Statistics of 1855, 60
 Steel making and foundry iron outputs, 432
 Structural shapes, 1829, 1842
 25-million ton year, 1989
 Iron and steel trade:
 April exports and imports, 1846
 British consolidation, 180
 British markets and steel for San Francisco, 1623
 Chicago, in 1905, 106
 Cyclical parallels in the iron trade, 433
 Exports and imports in 1905, 511
 Factors in the iron trade outlook, 1688
 February exports and imports, 1176
 Fifty years in iron and steel, 58
 Fluctuations in prices, 1897-1905, 192, Sup.
 Foundry iron prices in Chicago, 512
 German iron market, December, 1905, 295
 Imports of manganese ores and metals, 969
 International, 2073
 Iron ore in international trade relations, 1191
 Iron trade prosperity in Europe, 282
 January exports, 901
 Lake ore, First shipments of, 1403
 March exports and imports, 1498
 November exports and imports, 231
 Philadelphia, in 1905, 110
 Pittsburgh trade in 1905. By R. A. Walker, 101
 Pittsburgh and Wheeling steel industry. By H. P. Bope, 284
 Prices of steel, Domestic and export, Testimony of E. H. Gary, 1324
 Rates on pig iron to Chicago, 1552
 Southern pig iron market in 1905. By J. A. Green, 187
 Wider distribution of activity, 968
 Iron and steel works, 210, 286, 357, 437, 520, 602, 691, 787, 886, 975, 1048, 1120, 1198, 1276, 1346, 1415, 1486, 1556, 1625, 1694, 1769, 1850, 1922, 1996, 2077
 List of new, 205
 Iron Molders' Union of North America, 1021, 1624, 1691, 1764, 1771, 1849, 1933, 1991, 2079
 Iron sand, St. Lawrence, Treating magnetically, 2074
 Isaacson, W. J., Retirement of, 435
 J.
 Jacks, Roller bearing, *1519
 Japan:
 Iron and steel market, 1992
 Machinery purchases, 204
 Jaschke, Otto. Loss of air in blowing iron furnaces, 1692
 Jewell, C. W., *918
 Johns-Manville, H. W., Co., 1910
 Johnson, C. S., *917
 Johnson, H. A. Advertising that looks like reading matter, 1515
 Johnson Hardware Co., *811

Johnston, O. W., *833
 Jones, S. E., *718
 Journalism in the U. S., History of, 65
 Junge, F. E. Gas power economics, 1392, 1462

K.

Kalamazoo Railway Supply Co., 428
 Kansteiner, F. A., *833
 Kaufman, A. H., *634
 Kavanaugh, Daniel, *2106
 Keighley, S., Metal Ceiling & Mfg. Co., 905
 Keller, Noah, *1002
 Kelly, C. L., *2106
 Kentucky Retail Hardware and Stove Association, 714, 815
 Keyser, E. T. Small craft and camp outfits, 1076
 Keystone Fence Co., 1267
 King, George J., 75
 King, John A., 83
 King, John S., Biographical sketch of, 70
 Kingfisher trademark, *1077
 Kirchhoff, Charles, *72
 Kleberg, A. H., *642
 Kornely, J., *640
 Krarup, M. C.:
 Automobiles, 493
 Motor vehicles for business work, 765
 Kretsinger, F. S. Letter from, 2022, *2023
 Kuderer mine ventilator, *1260

L.

La Belle Iron Works, 888
 Labor question:
 Amalgamated scales, 1690, 1753
 Australian laws, 275
 Compulsory education in the shops, 281
 Eight-hour bill, 1768, 1837
 Great Britain, Legislation in, 1739
 Iron molders' strike, 1624, 1691, 1764, 1771, 1849, 1933, 1991
 Lake labor troubles and the ore movement, 1688
 Legislative meddling with the foundry in Massachusetts, 781
 National Founders' Association opposes Anti-injunction bill, 1097
 New York legislation, 1036
 Notes, 299, 375, 449, 536, 613, 693, 788, 883, 987, 1050, 1131, 1217, 1274, 1567, 1645, 1704, 1761, 1852, 1940
 Open shop in the structural trade, 1620
 Profit sharing as a peace and profit maker. By R. M. Downey, 1106
 Report of British Royal Commission on labor troubles, 968, 1114
 South's labor problem, 1914
 Trade unions may not coerce their own members, 1395
 Union not held for a minority's acts, 375
 (See also Strikes; Wages.)
 Lackawanna open hearth work, 1900
 Lackawanna Steel Co., 1035
 Electric power for, 1552
 Ladner, C. F., *928
 Lake commerce through the Sault canals in 1905, 1398
 Lake Superior mining notes, 349, 534
 Lake Superior ore values, Enhancement of, 1340
 Lamp, Motor car, *249
 Langfitt, W. G., *730
 Larrabee, F. T., *386
 Larrabee, J. E., *827
 Lathe attachment for boring, Underwood, *54
 Lathe grinder, Coates', *1678
 Lathe head, Hendey, *1098
 Lathe threading tool, Wilson, *1901
 Lathes:
 Cutting an irregular box cam with aid of an air drill, *501
 Davis' cross feed turret lathe, *419
 Large electrically driven. By F. C. Perkins, *34
 McCabe double spindle, *868
 Niles 90-inch driving wheel chucking, *488
 Pratt & Whitney special turret, *335
 Prentice turret, *1976

Lotta & Martin Pump Co., 1460
 Lawn cleaver, Gem, *844
 Lawn mower grinder, Ideal, *745
 Lawn mowers:
 Acme high wheel, *247
 Capitol, *1521
 Lawson cheap copper scare, 489
 Lead production in 1905. By E. A. Caswell, 18
 Legal decisions:
 Railroad hauling, 710
 Trademark suit, 1027
 Unlawful persuasion in cases of strike, 1021
 Letters from the trade, 314, 379, 554, 1876, 1943
 Lidgerwood Mfg. Co., 1987
 Lieb, A. W., *634
 Lillenberg, N. Piping in steel ingots, 760
 Lincoln Electric Co., 776
 Lindenber, L., *729
 Linguists in business, Lack of, 1765
 Liquid measuring apparatus, 1545
 Local associations, Benefits of, 1949
 Lock, latch, hasp and staple, *556
 Locks, Chain of, Operated by one key, 1591
 Locomotive building in 1905, 221
 Locomotives:
 American, excel, 593
 Cylinders cast in steel, *680
 Lower boiler pressures, 33
 New South Wales, 221
 Tests. Report on, 1544
 Loew Mfg. Co., 1112
 Long Island City power station, *1184, *1254
 Loomis, E. A., *2107
 Lott, G. R., *841, *1150
 Loy, C. A., *1799
 Lucas, E. E., *385, *1799
 Lucas, W. P., *1799
 Luetkemeyer, H. W., 164
 Lunkenheimer Co., 343
 Luty, B. E. V. The sheet and tin plate trade, 181
 Lyon Metallic Mfg. Co., 1760

M.

Mable, Harry C., 74, *77
 McCabe Hanger Mfg. Co., 1079
 McCabe spindle lathe, *868
 McDonald, A. L., *2106
 McDowell, R. W. Factory cost and business methods, 1079, 1225
 McGuire, J. F., *928
 Machine molding and continuous casting of car wheels, *1
 Machine parts, Cast iron, Experiments on the strength of, 1903
 Machine shop methods, Economy of modern, 685
 Machine tool associations, 1842
 Machine tool costs, 1551
 Machine tools:
 Chemist in the machine shop. By H. S. Brown, *1746
 Electric driving, Firth-Sterling Steel Co., *1737
 Future development of, 1192
 Machinery dealer, Protection of the, 782
 Machinery requirements, Publicity for, 1989
 Machinery trade:
 Chicago, 125, 302, 370, 452, 615, 705, 899, 989, 1135, 1213, 1359, 1428, 1501, 1639, 1707, 1866, 1937, 2010
 Cincinnati, 228, 369, 454, 533, 618, 706, 900, 991, 1065, 1135, 1214, 1292, 1360, 1431, 1503, 1571, 1642, 1784, 1866, 2012, 2092
 Cleveland, 303, 453, 617, 801, 1063, 1214, 1361, 1431, 1642, 1867, 2093
 New England, 126, 229, 303, 371, 453, 531, 616, 704, 799, 899, 991, 1064, 1136, 1211, 1290, 1359, 1430, 1502, 1570, 1641, 1709, 1783, 1865, 1938, 2011, 2091
 New York, 121, 224, 300, 369, 450, 530, 614, 702, 798, 897, 988, 1061, 1133, 1210, 1289, 1357, 1427, 1499, 1568, 1639, 1706, 1782, 1863, 1935, 2008, 2089
 Philadelphia, 225, 301, 370, 451, 532, 615, 704, 800, 900, 990, 1062, 1134, 1212, 1291, 1358, 1429, 1502, 1569,

Machinery trade (continued):
 1640, 1708, 1783, 1864, 1938, 2009, 2092
 Springfield and Columbus, Ohio, 1571
 McIntosh, G. T., 166
 McIntosh, W. R., *545
 McKeesport Tin Plate Co., 568
 McKenvey, F. B., *841
 McNamara, H. L., *640, *1150
 McRath, J. H., *2106
 Madden & Morrison File Co., 1147
 Magnesite deposits of California, 507
 Magnesium in the brass foundry, 768
 Magnetic brake, *417
 Magnetite, Commercially pure, 1192
 Magnets, Chilled cast iron, for permanent, 867
 Maher, William H., 167
 Mail consolidation scheme, 239, 1579, 1650
 Mail order problem, 1299, 1438
 Manganese metals, Supply of, 1341
 Manganese mining in 1905, 1830
 Manganese ores, Revised price schedule, 875
 Manson, J. A., *2106
 Manson's delivery record, 244
 Manufacturer, The, and the annoyance of erroneous news, 1270
 Manufacturers' trade numbers, 1146
 Marks, Strickland K., *71
 Marshall-Wells Hardware Co., 384
 Maryland Steel Co., 574
 Mashek, G. J. Briquetting of fuels and minerals, *1330
 Massachusetts aid to industrial schools, 1340
 Master Car Builders' Association, 1479
 Mat, Ideal leather, *1377
 Matchbox machinery, *1024
 Mathews, M. S., *928
 Mathews, T. J., *841
 Mattison, L. G., *827
 Mechanical Appliance Co., 1329
 Meeks, Reginald. The foundry on a chemical basis, 20
 Mendenhall, William, *633
 Mercury vapor lamp, Cooper Hewitt, for industrial lighting, 1757
 Mesaba range:
 Handling material on the, 963
 Western iron range. By D. E. Woodbridge, *420
 Meserve, A. B., *629
 Metal alloy decision accepted, 1107
 Metal prices, Fluctuations in, 1894 to 1906, 344
 Metallurgical problems in the foundry. By R. Moldenke, 516
 Metals and their ferro alloys, 666
 Mexico:
 Finance and foreign trade, 180
 Railroad and business notes, 500, 902, 1197, 1840
 Railroad building, 1400
 Trade and development in 1905, 115
 Meyer, A. F., *736
 Michipicoten range statistics, 263
 Mletz & Weiss oil engine pumping set, *878
 Miles, S. R., *729, *1148
 Mill, Gardner universal, *1113
 Miller, C. H., *635
 Miller, G. P. Factory cost systems, 1585
 Miller, J. A. Piping history repeating itself, *264
 Milliken Brothers, Incorporated, 1899
 Milling attachment for lathes, McDonald, *1983
 Milling machines:
 Becker-Brainard, *671
 Bement four-head, *1531
 Fox, *1110
 German universal, *339
 Ingersoll combined horizontal and vertical spindle, *1457
 Underwood portable, *1394
 Milwaukee Metal Trades and Founders' Association, 359, 428
 Mine workers and the anthracite coal operators, 434
 Mining towns, Model, 1469
 Minnesota Hardware Association map, 927
 Minnesota Retail Hardware Association, 919
 Mirror, Extension arm, *1380

Missouri Hardware Association map, 832
 Missouri Retail Hardware Association, 714, 829
 Mitchell, E. E., *1949
 Mitchell, F. D., *2025
 Miter box, Victor folding, *2108
 Moldenke, Richard. Metallurgical problems in the foundry, 516
 Molders of Pacific Coast, Advance to, 1916
 Molders' patterns free of duty, 863
 Molding. (See Machine molding.)
 Molding machines:
 Berkshire, *2070
 Larger place for, 1988
 Molding sand. By H. E. Field, 951
 Molds, Permanent, and carbon cores. By H. C. Caldwell, 266
 Money drawers, *477
 Money market and general business, 99
 Monnot metals, 52
 Moptana copper war ended, 613
 Moore, E. C., *729
 Moore, G. L., *635
 Moore, H. T., *2106
 Mop wringer, Molly Stork, *478
 Mossberg Wrench Co., 1258
 Motor Boat and Sportman's Show, 713
 Motor boats, Federal regulation of small, 1278
 Mountain Iron mine, Record shipments in 1906, 1841
 Mowry, E. S. Electro-galvanizing, *352
 Mueller, O. E., *1002
 Murphy, James, *642
 Murray disk sharpener, *1320
 Mutual Mfg. Co., 240, 1613
 Muzzy, F. E., on parcels post, 1305

N.

Nail and wire market in 1905, 243
 Nail bin, Revolving, *1519
 Nail puller, Neverslip, *477
 Nails:
 Dating nails for railroad ties, 1179
 Production of, in 1905, 1512
 Sherman roofing, *322
 National Association of Credit Men, 1984
 National Association of Manufacturers, 1625, 1684, 1689
 National Association of Stove Manufacturers, 1614
 National control of national business questions, 432
 National Erectors' Association of Bridge and Structural Iron Workers, 1620
 National Founders' Association, 1021, 1097, 1624, 1764
 National Hardware Association History, 157
 National Machine Tool Builders' Association, 1485, 1535, 1551
 National Metal Trades Association, 883, 1045, 1102
 National Metallurgical Co., 1321
 National Retail Hardware Association, 1072, 1148
 National Supply and Machinery Dealers' Association, 672
 Neal & Brinker Co., 1371
 Neal & Brinker Co.'s store, *1228, *1303, *1375, *1440, *1514, *1588, *1655, *1723, *1794, *1877, *1954, *2033
 Neal-Challen-Scott Co., 1439
 Nebraska Hardware Association map, 740
 Nebraska Retail Hardware Association, 627, 735
 Neudorff, Frederick, *833
 New Britain half a century ago, 142
 New Doty Mfg. Co., 1337
 New England Foundrymen's Association, 262, 667, 1031, 1977
 New England Iron and Hardware Association, 383, 2107
 New England Retail Hardware Association, 310, 933
 New Jersey Briquetting Co., *1330
 New York General Metal Works, 1342
 New York Hardware Club, 312
 New York Metal Trades Association, 448
 New York and New Jersey Hardware and Iron Association, 1005

New York State Association of Retail Hardware Merchants, 715, 820
 Constitution, 824
 Newspaper, Trade, and commercial news, History of, 65
 Newton Machine Tool Works, 947, 1834
 Niagara:
 Canada's new interest, 1338
 Combined canal and power scheme, 1460
 Comparison of Niagara power plants. By O. E. Dunlap, *1165
 Conditions from the Canadian viewpoint, 1259
 Development on the Canadian side. By O. E. Dunlap, *753
 Power transmission development, 277, 416
 Preservation of Falls, 862
 Niagara Machine & Tool Co., 1335, 1620
 Nichols, C. M., *934
 Nichols, T. A., *730
 Nichols & Langworthy Machine Co., 1172
 Nickel steel and its application to boiler construction. By G. B. Waterhouse, 490
 Niles-Bement-Pond Co., 39, 1531, 1606, 1814
 Nish, L. D., *841
 North Dakota, Map of, *548
 North Dakota Retail Hardware Association, 542
 Northwestern Iron Co., 1898
 Northwestern Iron & Steel Co., 1287
 Norton Co., 2034
 Norton Emery Wheel Co., 1532
 Norton Grinding Co., 1263
 Norvell, S., *629
 Norwich Industrial Exhibition, 1652
 Nova Scotia's steel industry in 1905, 670
 Novelty Mfg. Co., 1179
 Nuts:
 Bull Dog lock, *1880
 Gaines automatic lock, *1802
 Nuts and rings, Making, without waste, *2048
 Nuttall, R. D., Co., 38
 Nutting, J. R. The early and the later days, 156

O.

Oaks, S. C., *735
 Obituaries:
 Adams, H. A., 1558; Allen, W. P., 285; Almond, T. R., 1189
 Bannister, Lemuel, 1344; Beach, J. C., 1118; Bell, T. M., 2074; Bindley, Edwin, 1000; Brill, G. M., 1189; Brown, H. F., 1485; Buckingham, G. B., 1934
 Campbell, S. M., 1274; Chandler, Frank, 1300; Chapman, J. L., 238; Cole, Alan, 1582; Cottrell, G. J., 380; Cowles, F. S., 998; Croes, J. J. R., 1047; Curry, D. M., 2074
 Dale, David, 1628; Dana, G. E., 1513; Davis, F. E., 355; Delamater, Wm., 971; Donaldson, John, 436; Dougherty, John, 113; Draves, W. A., 1047; Duffy, T. E., 971
 Edwards, Edward, 885
 Filler, Enoch, 519; Fish, H. C., 355; Fowler, Anderson, 600; Fuchs, Gustav, 1628
 Gayer, G. H., 885; Gilbert, Edwin, 999; Griffin, F. A., 113; Guthrie, C. S., 223
 Hager, Charles, 930; Hamilton, John, 1274; Hartness, J. W., 1628; Hendy, S. J., 1118; Higgins, T. L., 1628; Hills, J. H., 113; Hirsch, Carl, 436; Hitchcock, P. M., 1934; Hodge, J. M., 2007; Hosford, G. K., 971; Howard, H. W. B., 1344; Howard, J. L., 1628; Howe, J. W., 693; Hulbert, E. S., 1274; Hull, H. D., 380; Hyde, Salisbury, 285
 Jeffery, W. M., 1934; Jewett, F. A., 1274; Jones, T. O'C., 1861
 Kafer, J. C., 1189; Kayser, C. W., 1861; Knight, C. C., 2074; Krause, George, 724; Kurtz, D. B., 1118
 Lauth, J. N., 1628; Leavenworth, W. J., 380; Leitelt, Adolph, Jr., 1558; Leutscher, G. L., 1412; Lewis, W. J., 223

Obituaries (continued):

McCaffrey, H. L., 1412; McKay, James, 1485; MacNaughton, James, 113; Mathewson, J. E., 2007; Merrick, J. V., 1189; Motter, G. F., 1047
 Nealey, J. A., 2018; Newhall, W. E., 1558; Newton, C. C., 2007; Nulsen, J. C., 1934
 Paxson, J. W., 223; Pengilly, John, 971
 Richards, David, 1274; Rider, W. B., 1344; Round, David, 971; Rustin, Henry, 885
 Sawyer, Ezra, 519; Saylor, F. H., 1344; Sheridan, W. H., 885; Sickels, Robert, 1371; Smith, D. C., 236; Snelus, G. J., 2074; Stannard, R. R., 223; Stanton, John, 772; Stewart, R. C., 1047; Stinson, C. L., 1485
 Taft, J. C., 600; Teiper, Casper, 1047; Thomas, Samuel, 693, 773; Towne, F. P., 516; Tripler, C. E., 2074
 Webb, F. W., 2007; Webber, M. H., 285; Williamson, H. C., 1558; Wilson, A. G., 113; Wilson, E. H., 600; Wordhouse, Wm., 1073; Wright, A. M., 553
 Zehnder, W. D., 1444
 Ocker, S. L., *719
 Ohio Hardware Association, 910
 Ohio Hardware Association map, 916
 Ohio Shovel & Stamping Co., 2103
 Oil engine, Strang, *191
 Oil separator, Greenaway, *1906
 Oil tanks, Handy, *1448
 Oil transformed to water, 1533
 Oilers:
 B-line motor, *844
 Diamond J spring, *1378
 Oils, Lubricating, Government tests of. By A. B. Willits, *332
 Oklahoma City Hardware and Manufacturers' Club, 1513, 2106
 Oliver Estate, James B., 577
 Oliver Iron Mining Co., 352, 858, 1759
 Ontario Hardware Merchants' Association, 1720
 Ontario laws and enterprise, 1644
 Open hearth furnaces, Cost of Talbot and stationary, 1670
 Open hearth practice getting the preference, 513
 Orcutt, W. M., *2106
 Ore thawing plant of the Zenith Furnace Co., *41
 Oregon State Retail Hardware and Implement Dealers' Association, 1581
 Otis Elevator Co., Annual report, 1101
 Outerbridge, A. E., Jr. Strength and softness in the same casting, 686
 Oxone, 1273
 Oxygen for removing furnace obstructions. By C. de Schwarz, 1608

P.

Pacific Coast, Engineering works on, 1466
 Pacific Coast trade, 223, 277, 409, 677, 774, 959, 1193, 1407
 Packing goods for foreign markets, 684
 Paddock, Gains. Hardware trade in 1856, 155
 Pail, Jones Minnow, *1082
 Paint:
 Catalogue house, 720
 Paints in the hardware store, 816
 Practical paint salesmanship, 921
 Testing of protective, 1781
 Paint law, 544
 Painting machine, Hercules compressed air, *845
 Palmers' docks cableway, *678
 Pan-American conference, Third, 972
 Parcels post, 467, 551, 717, 1003, 1305, 1792
 Parker, E. W. Coke making in the United States, 9
 Partine, 966
 Passaic Steel Co., 1216, 1849
 Patterns, Molders', free of duty, 863
 Pearson type casting machine, *177
 Peck, C. A., *640
 Peirson, F. E., *934
 Pelton, F. E., *827
 Pelton specialties, *1101
 Penick, R. L., Portrait of, *464

- Penn Steel Casting & Machine Co., 680
 Pennsylvania Association map, 637
 Pennsylvania factory inspection, 2069
 Pennsylvania Molding Process Co., 1542
 Pennsylvania Railroad Co., 42
 Pennsylvania Retail Hardware Dealers' Association, 633
 Pennsylvania Steel Co.:
 Report, 1612
 Steelton, Pa., plant, 2051
 Pennsylvania Wholesale Hardware and Supply Association, 999
 Perkins, F. C.:
 Electric canal haulage, *567
 Large electrically driven lathes, *34
 Personals, 113, 212, 283, 355, 435, 519, 600, 693, 785, 885, 972, 1047, 1118, 1200, 1274, 1344, 1409, 1485, 1558, 1628, 1693, 1770, 1850, 1934, 1994, 2078
 Petroleum, World's output of, 13
 Phelps, J. De F., *812
 Philadelphia Foundrymen's Association, 201, 592, 956, 1270, 1541, 1895
 Philadelphia Hardware Merchants' and Manufacturers' Association, 463
 Philadelphia iron trade in 1905. By Thomas Hobson, 710
 Philadelphia's new subway, 40
 Philippines, United States trade with, 1993
 Phoenix Iron Works, 1813
 Pickands, Mather & Co.'s mines, 272
 Pierce, B. C., *935
 Pinkerton Mfg. Co., 1178
 Pioneer furnaces, 1986
 Pipe:
 Manufacture of soil pipes and fittings. By T. J. Best, 2075
 Power required to thread twist and split. By T. N. Thomson, *346
 Universal pipe, *1543
 Pipe fittings and flanges. By J. A. Miller, *264
 Pipe industry, Cast iron, 1915
 Pipe machine, Loew Victor, *1112
 Pipe price extender, Burns, 1656
 Piping in steel ingots. By N. Lillenberg, *760
 Piqua Foundry & Machine Co., 1908
 Pitman Pelton water wheel with adjustable nozzle, *876
 Pittman, J. M., *1949
 Pittsburgh. Pre-eminence of, in transportation, 1022, with map
 Pittsburgh and Wheeling. Steel industry of. By H. P. Bope, 284
 Pittsburgh Coal Co., Annual report, 758
 Pittsburgh Foundrymen's Association, 536, 883, 1200
 Pittsburgh Industries in 1850, 186
 Pittsburgh iron trade in 1905. By R. A. Walker, 101
 Pittsburgh vein, Output of coal from, 1195
 Pixley, F. L., *1002
 Planer leveling device, *1263
 Planing machine, Cincinnati variable speed, *763
 Plate bending rolls:
 Badger, *757
 Cincinnati, *1-69
 Plating apparatus, Zucker & Levett & Loeb, *1405
 Plumb rules or levels, Mason, *247
 Pneumatic tools, Thor, *1675
 Porter, F. F., *841
 Post anchor, Miller, *1956
 Post check currency campaign, 239, 1579, 1650
 Post Office Appropriation bill, 1874, 2021
 Postage on merchandise, Reduction of, 389
 Potato planter, Sheffield, *1009
 Powell, Louis W., and copper mining, 270
 Powell, William, Co., 1180
 Power & Mining Machinery Co., 1389
 Power plant efficiencies. By H. G. Stott, 1334
 Power plant of the Chattanooga & Tennessee River Power Co., Hale's Bar, Tenn., 1546
 (See also Electric power.)
 Pratt, Wm. M. Our great industrial mechanism, 155
 Precious stones, production and importation, 2067
 Prentice Brothers Co., 1976
 Pressed Steel Car Co., Annual Report, 709
 Presses:
 Bliss automatic, for wired can tops, *257
 Bliss special feed, *1329
 Standard geared single acting, *1970
 Price-lists, Uniform, 265
 Prices:
 Enforcement of restricted, 1230
 Iron and steel products, 1897-1905, 192
 Printing plant of *The Iron Age*, *84
 Profit sharing as a peace and profit maker. By R. M. Downey, 1106
 Progress of half a century, 55
 Protective coatings, Testing of, 1781
 Pumping engine, Tod, 1189
 Pumping plant, Toronto high service turbo, 1167
 Pumps:
 Bisbee copper mine, 1271
 Columbus impeller. By E. K. Hood, *1756
 Garage, *478
 Imperial-Wilson air pump, *559
 Latta-Martin pneumatic, *1460
 Protector spray, *745
 Light feed oil pump, *879
 Punch and shear:
 Cincinnati motor driven, *1534
 New Doty double end, *1337
 Punches:
 Pin, *246
 Rogers' belt, *475
 Punching machine, Excelsior automatic multiple, *859
 Pyrometer, Low resistance thermo-electric. By W. H. Bristol, *1610
 Q.
 Quantity differentials, The effects of. By W. W. Webber, 1945
 R.
 Rail specifications, 2058
 Rail trade, Foreign, 1288
 Railroad buying, Sustained, 1269
 Railroads:
 Building activity, 1115
 Canada, Building in, 25
 Central Illinois Construction Co., Single phase equipment, 1119
 Legal decision on commodities they haul, 710
 Mesaba Range, 1813
 Municipal ownership of Chicago street railways, 2046
 New York subway lines projected. By S. D. V. Burr, *410
 Penn:
 High standard for cars, 780
 Long Island City power plant, *1184
 New York station, 1683
 Record of coal and ore roads, 1745
 Statistics of the world, 2064
 Rails:
 Annealing, Effect of, on steel, 1398
 Curve wear on, 508, 596
 Duty in Canada, 1182
 International agreement on, 198
 Open hearth and Bessemer steel, 1480
 Production of steel, in 1905, 509
 Specifications for steel, 424, 1195
 Steel rail exports, 684
 Railway Steel Spring Co., 882
 Ralston side dumping car, *1019
 Ralston Steel Car Co., 775
 Ramm, E. H., *641
 Rapid transit plans for Greater New York, 202
 Rate legislation, 2025
 Rates on coke and pig iron to Chicago, 1552
 Ray, L. D., *842
 Raymond, R. W., on engineers' commissions, 1978
 Razors:
 Evolution of the safety, 470
 Felt pad, *322
 Reciprocity project, New, 860
 Reckefus, S. S., 78, *82
 Recording electric instrument, Westinghouse, *1110
 Recording pressure gauges, Bristol, *1401
 Recording transmission dynamometer at Worcester, *778
 Reed multiple drilling attachment, *1683
 Refractories and fire brick, 518
 Refrigerators:
 De Vaux metallic, *1084
 Herrick, *246
 Registers, Columbian tubular, *1446
 Reinforced concrete:
 Steel bars for, 1323
 Steel forms for, *193
 Repair casting, Making difficult, *950
 Repair parts, Selling policy, 2072
 Republic Iron & Steel Co.:
 Changes, 1687
 Revised scrap specification, 1046
 Wages, 1991
 Retailer's cost of doing business. By E. N. Howell, 1947
 Right angle drive, Almond, *965
 Rim gear, Fogarty detachable, *2061
 Ritter, J. H., 1582
 Roberts, Nathan, *735
 Rockwell, G. W., *1148
 Roebbing Works, New, 1399
 Roll removing device, *418
 Roller skates, Winslow, *332
 Rolling mill wage scale conferences, 1761
 Rolling mills:
 American, British engineer's opinions, 958
 Drive construction, *1250
 Electric drives in Swedish mills, 1830
 German cold, *1893
 List of new mills, 205
 Methods of driving, *865
 Rolling sheets without doubling, 1679
 Roof failure at Charing Cross Station, London, 273
 Rope, Waterproofing transmission, 434
 Roteng Engineering Corporation, 1319
 Rubber stamp, Use of, in checking up invoices. By J. M. Townley, 1301
 Rubbish incinerating plant, New York. By S. D. V. Burr, *496
 Russell & Erwin Mfg. Co. of New York, 1952
 Russia:
 Machinery purchases, 204
 Metal duties, 1751
 Rust Boiler Co., 2074
 Ryan tilting steam trap, *1320
 Ryerson, Joseph T., & Son, 271
 S.
 Sad iron, Self heating, *1380, *1800
 Sale, A. R., *728
 Salesmen
 Advice for. By F. B. Ellsworth, 1374
 Best method of posting traveling men. By W. S. Sanford, 1945
 Good salesmanship, 722
 Necessary expenses. By F. B. Ellsworth, 2104
 Traveling men, 822
 Salt shaker and pepper grinder, *557
 San Francisco addresses, 1691, 1722
 San Francisco disaster, 1410, 1413, 1542
 Cause of earthquake, 1753
 Rebuilding of, 1682, 1838
 Steel structures. By George Simpson, *1815
 Steel structures in the disaster. By George Simpson, *1815
 San Francisco hardware interests, 1439, 1583
 San Francisco labor unions, 2073
 San Francisco steel market, British, 1623, 1894
 Sand, Molding. By H. E. Field, 951
 Sanders, H. M., *933
 Sanford, W. S. Best method of posting traveling men, 1945
 Sang, Alfred, Address by, 2028
 Sargent, George H. New York in the fifties, *144
 Sargent & Co.'s convention, 2101
 Sash holder, Automatic, *2035
 Sash lock, Hubbard, *474
 Savings bank, Three coin, *556
 Saw clamp, C. C. Co., *1156
 Saw filer for bevel filing, *558

- Saward, F. E.:
Coal trade, 259
Threatened coal strike, 582
Sawing and slotting machines, *184, *947
Saws:
Bishop Handy, *1446
Crescent angle band saw, *1173
Selling, 818
Thor air driven portable, *1978
Tindal high duty, *1168
Sawyer, Harry. The electric crane in the foundry, 1845
Saxton, A. H. Jobbing trade fifty years ago, 148
Scheurer, R. G., *842
Schlafer, O. P., *641
Schmidt, C. F., *730
Schmidt, Julius, *928
Schultz, Fred. W., *82, 83
Schwarz, C. de. The use of oxygen in removing furnace obstructions, 1608
Scotland:
Iron and shipbuilding, 1895
Iron and steel trade, 345
Prosperity in metal working industries, 1396
Scott, W. G., *1720
Scrap:
Freight classification of, 1177
Use of, at basic steel works, 1114
Scrap busheling press, Famous, *1397
Scraper, Box wheel, *843
Screen, Metallic adjustable, *1233
Screw machines:
Simplex four-spindle automatic, *198
Universal multispindle automatic, *403
Screw plates, Hercules, *1881
Scully Steel & Iron Co., 201
Seneca Chain Co., 469
Sewing machines:
Demorest, *2109
Hardware store handling of, 1145
Volo, *1881
Sewing machines for the aggressive hardwareman, 2101
Shacklett, U. S., *820
Shaping machines:
American back geared crank, *492
Cincinnati, *415
Eberhardt, *42
Sharon Steel Hoop Co., 299
Shaw, F. H., *1799
Shaw Electric Crane Co., 24
Shear, punch and bar cutter, Buffalo continuous, *769
Shearer, A. L., *917
Shearing machines:
Bliss automatic muck bar, *1754
German electric bloom shear, *578
Hilles & Jones lever shear, *422
Wais duplex, *863
Waterbury Farrel special pillar, *1832
Sheet and tin plate trade, 1914. By B. E. V. Luty, 181
Shelby Steel Tube Co., 1761
Shenango Furnace Co., 508
Sherwood, C. P., *826
Shidler, A. N., *718
Shipbuilding:
Development of, on the Great Lakes, 202
World's, in 1905, 299
Shipping bill in Congress, 708, 964, 1117, 1271, 1618
Shoop, W. T., *833
Shop directory, 1990
Shop management, 1545
Shops of Ernst Wiener Co., *1896
Sickels, Robert, *1371, 1654
Sidewalk tools, Cement, *845
Sight Feed Oil Pump Co., 879
Signatures, Old time, of hardwaremen, *1078
Silicon-manganese pig iron determination, 871
Simmons, E. C. Half a century in hardware, *145
Simmons Hardware Co., Sale of St. Louis store, 1584
Simonds Mfg. Co., 320
Simpson, George. Steel structures in the San Francisco disaster, *1815
Simpson, J. H., *1581
Sims-Kent Steel Casting Works, 878
Skylights, National system of puttyless, *338
Slag car, *1389
Sleeve board, Yankee notion, *249
Slide rule formula, 1272
Sliding scale and American gas, 595
Sloss-Sheffield Steel & Iron Co., Report, 987
Smelting, Electric, Success, of, 797
Smelting, Electric iron, at the Sault, 690
Smith, Henry, *77, 80
Smith, William Sooy. Fireproofed steel construction, 1609
Snaps, Hubbard, *475
Souer, J. R., *820
South Carolina Retail Hardware Association, 2020
South Dakota Hardware Association, 389, 1002
Southern Hardware Jobbers' Association, 1143, 1581, 1722, 1944, 2022
Southern Power Co., 354
Southern Steel Co., 1830
Southern Supply and Machinery Dealers' Association, 971, 1037
Spain, Iron and steel in, in 1905, 1337
Spang, Chalfant & Co., 299
Specifications for steel rails, 424, 1195
Spelter production in 1905, 1044
Spiker, R. L., *386, *1799
Sprague Electric Co., 200, 956
Square, Hight combination, *1082
Stand, Portable, *1956
Standard Chain Co., 858
Standard Machinery Co., 1970
Standard Mfg. Co., 1181
Standard Steel Car Co., 1458
Standards for materials of construction, British, 343
Stanton, John, Biographical sketch of, *772
Steam motor, Roteng, *1319
Steam shovels on the Mesaba range, 963
Steam traps:
Greenaway, *1749
Ryan tilting, *1320
Youngstown, *585
Steam turbines:
Backstrom-Smith, *1680
Exhaust steam, Use of, 43
Marine, Rights to build Parson's, 299
Slam power plant, 1248
Steamer, Hooser and Mason, ore carrier, *14
Stearns, Joseph L., 75
Stebbins, A. T., *928, *1149
Steel:
Boiler specifications, 2060
British open hearth steel in 1905, 769
Copper in, Effect of, 1609
Corrosion of tube steel, 2057
Determination of chromium in, By Edward Herms, 667
Electric conductivity, 2056
Electrical melting at Disston plant, *1811
Electrolysis, 2056
Electro-thermic production of, 1471
German basic steel in England, 1166
Heat treatment of, 1779
Range in tensile properties of a low carbon steel. By J. E. Howard, 1404
Schwartz process, 1389
Specifications for structural, 1195
Spellerized steel, 1924
Talbot continuous process, 948
Tariff on shipbuilding steel, 373
Vanadium in, Effects of, 1273, 1344
Widening range of uses for steel, 1190 (See also Iron and steel.)
Steel bars for reinforcing concrete, High carbon, 1323
Steel casting syndicates in Germany, 884
Steel castings. (See Castings.)
Steel construction, Fireproofed. By William Looy Smith, 1609
Steel ingots:
Compression of, in the mold. By A. J. Capron, *1762
Largest made, 1095
Piping in, By N. Lillenberg, *760
Steel merger rumors, 871
Steel reinforcement of concrete, *191, 1323
Steel wool test case, 515
Steinhart, A. A new development in dry blast, *1032
Steitler, A., Jr., *820
Sterling Coal & Coke Co., 491
Sterling Emery Wheel Mfg. Co., 273
Stevens, H. J. Copper mining in 1905, 114
Stewart, R. T. Collapsing pressures of Bessemer steel lap welded tubes, *1472
Stewart, T. B., Address by, 1948
Stewart gas furnace, *962
Stockall, Arthur. Handling of tool steel, 342
Stoker, Hawley chain grate, *1984
Stoker, Mechanical, for locomotives, 964
Stove Departments in the hardware, 2102
Stove Founders' National Defense Association, 1616
Stove trade, Conciliation in the, 1116
Straight edges, Brown & Sharpe, *323
Strang oil engine, *191
Strap iron, Handling, at retail, 2019
Strikes:
Coal strike, 535, 582, 973, 1043, 1047, 1119, 1216, 1288, 1343
Efforts to assert coal strike, 797
Iron molders' strike, 1624, 1691, 1764, 1771, 1849, 1933, 2079
Pig iron production and an anthracite strike, 1043
Prevention of strikes. By S. S. Deemer, 686
Proposed legislation in aid of strikers, 594
Unlawful persuasion in cases of, 1021
Whitaker-Glessner, 1766
(See also Labor question; Wages.)
Structural shapes, Production of, 1829, 1842
Sturtevant, B. F., Co., 406, 506, 1535
Subway lines projected in Greater New York. By S. D. V. Burr, *410
Subway plans for New York, 202
Supply and machinery conventions, 971
Sulphur, Standard determination of, 1902
Susquehanna Iron & Steel Co., 298
Swaine, Charles, *729
Sweden:
Export duty on iron ore, 1191
Iron and steel production in 1905, 1607
Swings, Porch, *2110
Sydney rod mill records, 515
T.
Tachodometer, Veeder, *649, *1750
Tack hammer, Longden, *557
Tack pullers, Hubbard, *1155
Tag, Salesman's advance, *1076
Taintor, C. C., 83
Talbot continuous steel process. By G. A. Wilson, 948
Cost of stationary and open hearth furnaces, 1670
Installations, 267
Tanning, Electricity in, 587
Tapping fixture, Lightning automatic, *1613
Tariff:
Attitude of National Association of Manufacturers, 1689
Bolts, screws, etc., Drawback on, 1099
Customs Administrative bill, 1906
Customs administration reform, 263, 495
Customs bonding regulation, 1908
Customs decisions, 190, 305, 429, 619, 707, 784, 986, 1044, 1194, 1272, 1406, 1465, 1541, 1607, 1755, 1844, 1909, 2076
Drawback on antifriction metal, 577
Drawbacks paid in 1905, 593
Fire brick duty, 1977
Fish plates, Old, 1394
German duties, Postponement of high, 780
Germany, Tariff relations with, 276
Motor cycles, 1975
Russian metal duties, 1751
Screw rods, Cold drawn, 1335
Steel cylinder case, 1406
Steel for shipbuilding, 373
Ten-day bond customs decision, 1705
Taylor, C. E., *1949

- Teitgen, Emil, *639
Tennessee Coal, Iron & R. R. Co.'s:
 Finances, 687, 1336, 1693, 1710
 Improvements, 1986
Texas Retail Dealers' Hardware and
 Implement Association, 464
Texas tin deposits, 1407
Thawing ore, *41
Thermit repair, 1399
Thomas, Samuel, Biographical sketch of,
 *773
Thompson, G. V., *634
Thompson, S. H., *933
Thomson, T. N. Power required to
 thread, twist and split pipe, *346
Thor pneumatic tools, *1675
Thread rolling machine, Waterbury Far-
 rel, *770
Ties, Steel:
 Progress of, 1042
 W. E. Cory on, 1548
Time checks and their use, 1224
Time recorders, *1449
Timmis, W. S. Manufacturing buildings
 in cities, *29
Tin:
 Alaska deposits, 1742
 Extraordinary prices for pig tin, 1554
 Imports and prices of, 1268
 Texas deposits, 1407
 Tin market of the world in 1905, 19
Tin plate:
 Prices and current costs, 1341
 Quality of, 781
 Statistics, 1553
Tin plate trade:
 American tin plate in Canada, 1411
 Penalty on increasing American, 1402
 Tire turning, Remarkable, *487
 Tod engine casting, *1540
 Tod pumping engine, 1189
 Tool cabinet, Autmo, *846
 Tool steel, Handling of. By Arthur
 Stockall, 342
Towers, Steel:
 Coney Island, proposed, 408
 Transmission line, *754
Towne, A. E., *827
Towne, F. P., Biographical sketch of,
 *516
Towne, Henry R. Industrial and com-
 mercial expansion, 150
Townley, J. M. Use of rubber stamp in
 checking up invoices, 1301
Track work, Indianapolis, *1322
Trade literature, 203
Trade newspapers and commercial news,
 History of, 65
Trade numbers, Manufacturers', 1146
Trade publications, 231, 279, 374, 456,
 529, 620, 804, 985, 1066, 1138, 1293,
 1362, 1484, 1549, 1638, 1711, 1786,
 1868, 1920, 1995, 2094
Trade unions may not coerce their own
 members, 1395
Trademark bill, 903, 1194, 1402, 1482
Trademark classification, 1833
Trademark infringement, Bill to punish,
 333
Trademark regulations, 2068
Trade winning methods, 317, 381, 909,
 1001, 1074, 1223, 1443, 1515, 1653,
 1797, 2102
Traps. (See Steam traps.)
Traylor Mfg. & Construction Co.'s new
 plant, *1836
Treat, I. C., *813
Trimmer, Roller bearing, *477
Trimont Mfg. Co., 667
Tritch, George, Recollections of, 1071.
Trout Hardware Co., 553
Trucks, Four wheel drive, *576
Tube combine, British, 1250
Tubes, Collapsing pressures of Besse-
 mer steel lap welded. By R. T.
 Stewart, *1472
Tubing, Flexible, Manufacture of, *2045
Tumbling barrel, Baird, *269
Tunnels:
 East River, Troubles with. By S. D.
 V. Burr, 1687
 Hudson River, Penn. R. R., 1322
 Ventilation of Gallitzin, 2051
Turbine water wheels, 1547
Turbines. (See Steam turbines.)
Turner, Thomas. Changes during the
 cooling of cast iron, *1671
Turntable, New Jersey overhead roller
 bearing, *1336
Turret attachment, Detroit, *584
Type casting machine, Pearson, *177
U.
Uhlig, Max, *735
Underwood, H. B., & Co., 1394
Underwood, W. H., *935
Underwood lathe attachment, *54
Unfug, Adolph, *629
Union Iron Works, 1498
United Coke & Gas Co.'s Otto coke oven,
 *659
United Engineering & Foundry Co., 1113
United Mine Workers of America, 285,
 689
U. S. Electrical Tool Co., 1335
U. S. Electro Galvanizing Co., 1980
U. S. Steel Corporation:
 Annual report, 1028
 Commission in San Francisco, 1849
 Extensions and betterments, 222
 Gary plant, 1832, 2062
 Indiana steel plant, 1417
 Plants as scrap consumers, 281
 Quarterly statement, 449, 1412
 Universal Machine Screw Co., 403
 Urbahn, A., *1799
V.
Valves:
 Dyblie reversing valve, *665
 Eurema Y valve, *1249
 Powell Union disk valve, *1180
Van Camp Hardware & Iron Co., 930
Vanadium in steel effects of, 1273, 1344
Veeder tachometer, *649, *1750
Ventilation of Gallitzin tunnel, 2051
Ventilators:
 Burt, *1235
 Kuderer mine, *1200
Vessels—Law for small power boats,
 1278, 1780
Viggers, W. Ferrosilicon or ferroman-
 ganese, 1044
Vincent, H. S., *728
Vises:
 Drill, *1378
 Oliver, *1234
W.
Wages:
 Amalgamated scales, 1690, 1753, 1862,
 1988, 1991, 2079
 Joint conferences on soft coal miners'
 wage scale, 439
 Molders of Pacific Coast, Advance to,
 1916
 Regulating assignments of, 970
 Rolling mill, 1761
 Wagner, Paul, *820
 Wals duplex shear, *863
 Walker, Robert A., *77, 78
 Pittsburgh iron trade in 1905, 101
 Warren, J. D. Mfg. Co., Plant of, *1377
 Warren, W. P., Address by, 1614
 Warren Foundry & Machine Co.'s Anni-
 versary, 1912
 Warship repair shops, Efficiency of, 1623
 Warwick Iron & Steel Co., 583
Washing machines:
 Hawkeye one-minute, *1009
 New Favorite, *1379
 Paragon cylinder, *1958
 Royal Blue, *2111
 Selling, 831
 Sunshine, *1379
 Waverly, *1447
 White Rose and White Daisy, *1593
 Washington hardware, 1223
 Water column, Vigilant safety, *343
 Water gas, Use of, in the arts, *336
 Water motor, Divine Red Devil, *1801
 Water wheel, Pitman Pelton, with ad-
 justable nozzle, *876
 Water wheel governing, 1546
 Waterbury Farrel Foundry & Machine
 Co., 770, 1832
 Waterbury Machine Co., 1758
 Waterhouse, G. B.:
 Color carbon estimation and the in-
 fluence of copper, 1179
 Nickel steel and its application to
 boiler construction, 490
 Waterproofing for concrete, 183
 Waterproofing transmission rope, 434
 Watson, B. G., *1002
 Webber, W. W. The effects of quantity
 differentials, 1945, *2024
 Wedge chorus, *1717
 West, T. D., Address by, 1847
 Western Bar Iron Association, 1761
 Western Electric Co.'s Hawthorne works,
 1686, 1749
 Western Malleable Steel Co., 1909
 Western Society of Engineers, 223
 Western Tube Co., 1249
 Western Tube Co. and its experiments
 with high duty metal, 1607
 Westinghouse Electric & Mfg. Co., 1110
 Financial statement, 423
 vs. Cutter Mfg. Co., 1060
 Westinghouse Machine Co., 1328
 Wheeler, F. B. Modern problems in gas
 engineering, 340
 White, H. I. Electrolytical galvanizing,
 260
 Wile, Julius. Gas producers for power,
 869
 Williams, C. H., *841
 Williams, David, Biographical sketch of,
 *68
 Williams, Hamp, *1949
 Williams, John, Biographical sketch of,
 *66
 Williams, Richard R., *72
 Willits, A. B. Government tests of lubri-
 cating oils, *332
 Wills steel cars, *1911
 Wilson, G. A. The Talbot continuous
 steel process, 948
Window display:
 Automobile, *1075
 Coffee pots, 1075
 Cutlery, *1578
 Cutlery and tools, *2102
 Eagle, *1074
 Indifference in window dressing, 817
 Johnson Hardware Co., *811
 Locomotives, *1074
 Musical display, *1369
 "Selling windows," *1797
 Sportsmen's outfits, *1444
 Tool windows, *381, *1443
 Touring exhibit, *1716
Winslow Brothers Co., 499
Winslow, Samuel E., 162
Wire, Corrosion of, 207
Wire industry, Growth in, 1480
Wire products, Consumption of, in the
 U. S., 1839
Wire rod production in 1905, 1400
Wire stretchers, Safety tackle block,
 *1083
Wisconsin Association, map, 646
Wisconsin Retail Hardware Association,
 639
Wisconsin Retail Implement and Vehicle
 Dealers' Association, 1376
Witherbee, Sherman & Co., 875
Woodbridge, D. E. The Western Mesaba
 iron range, *420
Woodhouse, William, Sketch of, *1073
Worcester Loom Co., Business methods,
 1306, 1372
Worcester Metal Trades Association,
 1412
Wrenches:
 B. & S. general service, *320
 Bay State, *1084
 Bay State ratchet, *1235
 Irland automatic pipe, *474
 Uwanta combination, *320
 Vandergrift wood handle, *323
 Victor reversible chain, *1232
 Wright, A. M., Sketch of, *553
 Wrigley, Weston, *1721
Y.
Yale & Towne Mfg. Co., 1744
Youngstown Sheet & Tube Co., 405
Youngstown Steam Trap Co., 585
Z.
Zenith Furnace Co.'s ore thawing plant,
 *41
Zucker & Levett & Loeb Co., 1405
Zug & Co., 515
Zug Iron & Steel Co., 1552
Zwoyer Fuel Co., 1330

